6Z10

Pentode—Beam Power Tube

DUODECAR TYPE

For Combined Limiter, Discriminator, and Audio Power Output Applications in FM Radio and TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage	E_h	6.3	V
Heater Current	I_h	0.950	A
Direct Interelectrode Capacitances			
Without external shield			
Pentode Unit:			
$G1_P$ to $G3_P$	$c_{g1\text{-}g3}$	0.009	pF
$G1_P$ to (K_P + IS, P_P, $G3_P$, $G2_P$, H)	$c_{g1\text{-}all}$	4.4	pF
$G3_P$ to (K_P + IS, P_P, $G2_P$, $G1_P$, H)	$c_{g3\text{-}all}$	3.2	pF
Beam Power Unit:			
$G1_B$ to P_B	$c_{g1\text{-}p}$	0.22	pF
Input: $G1_B$ to (K_B + $G3_B$, $G2_B$, H)	c_i	11	pF
Output: P_B to (K_B + $G3_B$, $G2_B$, H)	c_o	7.5	pF

Pentode Unit

For the following characteristics, see Conditions

Transconductance, Grid No.1 to Plate	g_m	-	-	360	μmho
Transconductance, Grid No.3 to Plate	$g_{m(g3\text{-}p)}$	-	-	700	μmho
DC Plate Current	I_b	-	5	-	mA
DC Grid-No.2 Current	I_{c2}	4.5	-	-	mA
Cutoff DC Grid-No.1 Voltage for I_b = 20 μA	$E_{c1(co)}$	-	-	-4	V
Cutoff DC Grid-No.3 Voltage for I_b = 20 μA	$E_{c3(co)}$	-	-	-4	V

Conditions

Heater Voltage	E_h	Bogey value			V
DC Plate Voltage	E_b	135	135	135	V
DC Grid-No.3 Voltage	E_{c3}	4	4	0	V
DC Grid-No.2 Supply Voltage	E_{cc2}	-	280	280	V
DC Grid-No.2 Voltage	E_{c2}	75	-	-	V
DC Grid-No.1 Voltage	E_{c1}	0	0	0	V
Grid-No.2 Resistor	R_{g2}	-	33	33	kΩ

Beam Power Unit

For the following characteristics, see Conditions

Plate Resistance (Approx.)	r_p	100	kΩ
Transconductance	g_m	6500	μmho
DC Plate Current	I_b	35	mA
DC Grid-No.2 Current	I_{c2}	3	mA

Conditions

Heater Voltage	E_h	Bogey value	V
DC Plate Voltage	E_b	250	V
DC Grid-No.2 Voltage	E_{c2}	250	V
DC Grid-No.1 Voltage	E_{c1}	-8	V

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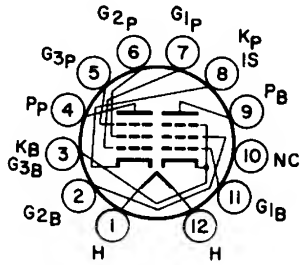
MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375 in
Maximum Seated Length	2.000 in
Maximum Diameter	1.188 in
Dimensional Outline (JEDEC 9-58)	See *General Section*
Envelope	JEDEC T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)

TERMINAL DIAGRAM (Bottom View)

Pin 1 – Heater
Pin 2 – Beam Power Grid No.2
Pin 3 – Beam Power Cathode, Beam Power Grid No.3
Pin 4 – Pentode Plate
Pin 5 – Pentode Grid No.3
Pin 6 – Pentode Grid No.2
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Cathode, Internal Shields
Pin 9 – Beam Power Plate
Pin 10 – No Internal Connection
Pin 11 – Beam Power Grid No.1
Pin 12 – Heater



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DESIGN-MAXIMUM RATINGS

Pentode Unit for FM and TV Limiter and Discriminator Service; Beam Power Unit for Audio Power Output Service

		Pentode Unit	*Beam Power Unit*	
DC Plate Supply Voltage	E_{bb}	330	-	V
DC Plate Voltage	E_b	-	275	V
DC Grid-No.2 (Accelerator-Grid) Supply Voltage	E_{cc2}	330	-	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	-	275	V
Peak Positive-Pulse Grid-No.1 (Limiter-Grid) Voltage	e_{c1m}	60	-	V
Heater-Cathode Voltage:				
Peak	e_{hkm}	±200	±200	V
DC	E_{hk}	100	100	V
Heater Voltage (AC or DC)	E_h	← 5.7 to 6.9 →		V
Average Cathode Current	$I_{k(av)}$	13	-	mA
Grid-No.2 Input	P_{g2}	-	2	W
Plate Dissipation	P_b	-	10	W

MAXIMUM CIRCUIT VALUES

Beam Power Unit

Grid-No.1-Circuit Resistance:	$R_{g1(ckt)}$		
For fixed-bias operation	-	0.25	MΩ
For cathode-bias operation	-	0.5	MΩ

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

TYPICAL OPERATION

Beam Power Unit

Heater Voltage	E_h	Bogey value	V
DC Plate Voltage	E_b	250	V
DC Grid-No.2 Voltage	E_{c1}	250	V
DC Grid-No.1 Voltage	E_{c2}	-8	V
Peak AF Grid-No.1 Voltage	e_{c1m}	8	V
Plate Resistance (Approx.)	r_p	100	kΩ
Transconductance	g_m	6500	μmho
Zero-Signal Plate Current	I_b	35	mA
Maximum-Signal Plate Current	I_b	39	mA
Zero-Signal Grid-No.2 Current	I_{c2}	3	mA
Maximum-Signal Grid-No.2 Current	I_{c2}	13	mA
Load Resistance	R_L	5000	Ω
Total Harmonic Distortion		8.5	%
Maximum-Signal Power Output	P_o	4.2	W